particularly desirable when the shaft support structure is used as a steering column in an automobile. In the event that the automobile sustains a front end collision, it is preferred that the steering column collapse irreversibly forward along its longitudinal axis, to minimize impact between the steering wheel and the driver. The collapsible portion of the shaft support structure may, for example, include at least one of the following: thinner shell wall sections; slotted or perforated shell wall sections; reticulated or accordion-like shell wall sections; thinner plastic reinforcing ribs; and plastic reinforcing ribs that do not contain reinforcing materials, such as glass fibers.

[0052] Shaft support structure **2** of **FIGS. 1 and 2** has an irreversibly longitudinally collapsible section **71**. Collapsible portion **71** includes large apertures **56** in sidewalls **26** and **27** of shell **11**. The large apertures **56** in sidewalls **26** and **27** serve to allow shaft support structure **2** to irreversibly collapse along its longitudinal axis **44**, in response to a severe impact directed substantially along axis **44**.

[0053] Steering columns in many automobiles are reversibly adjustable or tiltable along a vertical axis that is substantially perpendicular to the longitudinal axis of the steering column. Such a reversible tilt adjustment allows the driver to position the steering wheel for improved ease of operation. Tilt adjustment of a steering column typically involves operating a separate mechanism, e.g., a rake adjustment mechanism, that abuts an exterior portion of the steering column, as is known to the skilled artisan. A rake adjustment plate is typically located on the exterior portion of the steering column that abuts the rake adjustment mechanism. The rake adjustment plate may be grooved to allow graduated tilt adjustment of the steering column.

[0054] In an embodiment of the present invention, and with reference to **FIG. 1**, the steering column support structure **2** is a steering column and has a plastic rake adjustment plate **38** fixed to the exterior of sidewall **26** of shell **11**. Rake adjustment plate **38** may be fixedly attached to the exterior of sidewall **26** by attachment means selected from fasteners, adhesives, snap connections and combinations thereof (not shown). Preferably, rake adjustment plate **38** is formed by molding, e.g., injection molding, of plastic material onto the exterior surface of sidewall **26** of shell **11**. A portion of the molded on plastic material of rake adjustment plate **38** extends through perforations in sidewall **26** (not shown), and embeds the edges of the perforations in the plastic, thereby fixedly attaching rake adjustment plate **38** to sidewall **26**. The plastic material of rake adjustment plate **38**, which fixedly extends through perforations in sidewall **26**, may optionally be continuous with reinforcing ribs **20**. Rake adjustment plate **38** may be molded on to sidewall **26** either prior to, concurrently with, or after the molded on formation of ribs **20** on interior surfaces **14** of shell **11**.

[0055] The present invention has been described with reference to specific details of particular embodiments thereof. It is not intended that such details be regarded as limitations upon the scope of the invention except insofar as and to the extent that they are include in the accompanying claims.

What is claimed is:

1. A shaft support structure comprising:

(a) an elongated shell having interior surfaces which define a hollow interior; and

(b) a plurality of reinforcing ribs of plastic material located within the hollow interior of said shell, at least a portion of said reinforcing ribs being in abutting relationship with the interior surfaces of said shell, said reinforcing ribs defining a longitudinal passage through said elongated shell for receiving and supporting a rotatable shaft, and said reinforcing ribs being fixedly attached to said elongated shell.

2. The shaft support structure of claim 1 wherein said shell is fabricated from a material selected from metal, thermoset plastic material, thermoplastic material and combinations thereof.

3. The shaft support structure of claim 2 wherein said shell is fabricated from metal.

4. The shaft support structure of claim 1 wherein the plastic material of said reinforcing ribs is selected from thermoset plastic materials, thermoplastic materials and combinations thereof.

5. The shaft support structure of claim 4 wherein the plastic material of said reinforcing ribs is a thermoplastic material selected from thermoplastic polyurethane, thermoplastic polyurea, thermoplastic polyimide, thermoplastic polyamide, thermoplastic polyamideimide, thermoplastic polyester, thermoplastic polycarbonate, thermoplastic polysulfone, thermoplastic polyketone, thermoplastic polypropylene, thermoplastic acrylonitrile-butadiene-styrene and thermoplastic compositions containing one or more thereof.

6. The shaft support structure of claim 1 wherein said plastic material of said reinforcing ribs is reinforced with a material selected from glass fibers, carbon fibers, boron fibers, metal fibers and mixtures thereof.

7. The shaft support structure of claim 1 wherein said reinforcing ribs are fixedly attached to said shell by attachment means selected from fasteners, adhesives, snap connections and combinations thereof.

8. The shaft support structure of claim 1 wherein said reinforcing ribs form a continuous unitary structure within the hollow interior of said elongated shell.

9. The shaft support structure of claim 1 further comprising within said longitudinal passage at least one rolling bearing means for rotatably supporting said shaft.

10. The shaft support structure of claim 1 wherein said shaft support structure is a steering column and said rotatable shaft is a rotatable steering shaft.

11. The shaft support structure of claim 10 wherein at least a portion of said shaft support structure is irreversibly longitudinally collapsible.

12. The shaft support structure of claim 10 further comprising a rake adjustment plate fixed to the exterior of a side wall of said shell, said rake adjustment plate comprising plastic material.

13. A shaft support structure comprising:

(a) an elongated shell having interior surfaces which define a hollow interior, said shell having a plurality of perforations having edges; and

(b) a plurality of reinforcing ribs of plastic material located within the hollow interior of said shell, at least